Amendments to the Claims:

Claims 4-13, 16-21, 23-34, 37-40, 42-45, and 61-70 are pending at the time of the Office Action.

Claims 47-60 were withdrawn from consideration.

Claims 1-3, 14-15, 22, 35-36, 41, and 46 were previously canceled.

Claim 4, 16, 24, 43 and 45 are hereby amended.

Claim 71 is newly added.

Claims 4-13, 16-21, 23-34, 37-40, 42-45, and 61-71 remain pending.

1.-3. (Canceled).

4. (Currently Amended) A continuous process for applying a sol-gel coating to a metal material and an adhesive coating onto the sol-gel coating, the process comprising:

subjecting the metal material to a caustic solution of sodium hydroxide;

rinsing the metal material with water to remove the caustic solution of sodium hydroxide from the metal material;

applying a sol-gel coating to the metal material;

evaporating the water portion of the sol-gel coating;

applying a liquid adhesive coating directly to the sol-gel coating on the metal material wherein the liquid adhesive coating is an epoxy-based adhesive coating including:

an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber; and

a second curative material comprising chromium octotate, and at least one of ~~about 0-100% by wt.~~ 4,4'-diaminodiphenylsulfone, ~~about 0-100% by wt.~~ and 3,3'-diaminodiphenylsulfone~~, and about 0-0.2% by wt. chromium octotate~~; and

evaporating the solvent portion of the adhesive coating.

5. (Original) The process of Claim 4, wherein the metal material is selected from the group consisting of titanium, aluminum, stainless steel, nickel, and copper.

6. (Original) The process of Claim 4, wherein the caustic solution of sodium hydroxide has a concentration of about 10-50% by weight sodium hydroxide.

7. (Original) The process of Claim 4, wherein the caustic solution of sodium hydroxide has a concentration of about 25% by weight sodium hydroxide.

8. (Original) The process of Claim 4, wherein the temperature of the caustic solution is about 150-220°F.

9. (Original) The process of Claim 4, wherein the temperature of the caustic solution is about 190°F.

10. (Original) The process of Claim 4, wherein dry sol-gel layer is about 10-500 nm thick.

11. (Original) The process of Claim 4, wherein the dry sol-gel layer is about 100 nm thick.

12. (Original) The process of Claim 4, wherein the sol-gel is a mixture of a zirconium alkoxide, 3-glycidoxy-propyltrimethoxysilane, glacial acetic acid, and a surfactant.

13. (Original) The process of Claim 4, wherein the sol-gel is a mixture of zirconium n-propoxide, 3-glycidoxy-propyltrimethoxysilane, glacial acetic acid, and a surfactant.

14.-15. (Canceled).

16. (Currently Amended) A continuous process for applying an adhesive coating onto a sol-gel coating on a metal material, the process comprising:

applying a liquid adhesive coating directly to the sol-gel coating on the metal material, wherein the liquid adhesive coating is an epoxy-based adhesive coating including an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber; and

a second curative material comprising about 0-100% by wt. 4,4'-diaminodiphenylsulfone, about 0-100% by wt. 3,3'-diaminodiphenylsulfone, and about 0-0.2% by wt. chromium octotate; and

evaporating the solvent portion of the adhesive coating.

17. (Original) The process of Claim 16, wherein the metal material is selected from the group consisting of titanium, aluminum, stainless steel, nickel, and copper.

18. (Original) The process of Claim 16 wherein the liquid adhesive coating is applied in a dip-coating tank.

19. (Original) The process of Claim 16 wherein the liquid adhesive coating is applied by spraying.

20. (Original) The process of Claim 16 wherein the dry adhesive coating has a thickness of 0.1 to 3.0 mils.

21. (Original) The process of Claim 20 wherein the dry adhesive coating has a thickness of 0.75 mils.

22. (Canceled).

23. (Previously Presented) The process of Claim 16 wherein acetone is used as the solvent for the adhesive.

24. (Currently Amended) A continuous surface preparation process for a metal material comprising:

grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 180-320;

rinsing the metal material with water to remove the grit;

subjecting the metal material to a caustic solution of sodium hydroxide;

rinsing the metal material with water to remove the caustic solution of sodium hydroxide;

applying a sol-gel coating to the metal material;

evaporating the water portion of the sol-gel coating;

applying a liquid adhesive coating directly to the sol-gel coating on the metal material wherein the liquid adhesive coating is an epoxy-based adhesive coating including:

an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber; and

a second curative material comprising about 0–100% by wt. 4,4'-diaminodiphenylsulfone, about 0-100% by wt. 3,3'-diaminodiphenylsulfone, and about 0-0.2% by wt. chromium octotate; and

evaporating the solvent portion of the adhesive coating.

25. (Original) The process of Claim 24, wherein the metal material is selected from the group consisting of titanium, aluminum, stainless steel, nickel, and copper.

26. (Original) The process of Claim 24 wherein the grit has a mesh size of about 280.

27. (Original) The process of Claim 24 wherein the caustic solution of sodium hydroxide has a concentration of about 10-50% by weight sodium hydroxide.

28. (Original) The process of Claim 26 wherein the caustic solution of sodium hydroxide has a concentration of about 25% by weight sodium hydroxide.

29. (Original) The process of Claim 24 wherein the temperature of the caustic solution is about 150-220°F.

30. (Original) The process of Claim 24 wherein the temperature of the caustic solution is about 190°F.

31. (Original) The process of Claim 24 wherein the dry sol-gel layer is about 10-500 nm thick.

32. (Original) The process of Claim 24 wherein the dry sol-gel layer is about 100 nm thick.

33. (Original) The process of Claim 24 wherein the sol-gel is a mixture of a zirconium alkoxide, 3-glycidoxy-propyltrimethoxysilane, glacial acetic acid, and a surfactant.

34. (Original) The process of Claim 24 wherein the sol-gel is a mixture of zirconium n-propoxide, 3-glycidoxy-propyltrimethoxysilane, glacial acetic acid, and a surfactant.

35. -36. (Canceled).

37. (Original) The process of Claim 24 wherein the liquid adhesive coating is applied in a dip-coating tank.

38. (Original) The process of Claim 24 wherein the liquid adhesive coating is applied by spraying.

39. (Original) The process of Claim 24 wherein the dry adhesive coating has a thickness of 0.1 to 3.0 mils.

40. (Original) The process of Claim 24 wherein the dry adhesive coating has a thickness of 0.75 mils.

41. (Canceled).

42. (Original) The process of Claim 40 wherein acetone is used as the solvent for the adhesive.

43. (Currently Amended) A continuous surface preparation process for a metal material, said process comprising:

grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 180-320;

rinsing the metal material with water to remove the grit;

subjecting the metal material to a caustic solution of sodium hydroxide wherein the caustic solution of sodium hydroxide has a concentration of about 10-50% by weight sodium hydroxide;

rinsing the metal material with water to remove the caustic solution of sodium hydroxide from the metal material;

applying a sol-gel coating to the metal material wherein the sol-gel is a mixture of a zirconium alkoxide, 3-glycidoxy-propyltrimethoxysilane, glacial acetic acid, and a surfactant;

evaporating the water portion of the sol-gel coating;

applying a liquid adhesive coating directly to the sol-gel coating on the metal material wherein the liquid adhesive coating is an epoxy-based adhesive coating including:

an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber; and

a second curative material comprising about 0-100% by wt. 4,4'-diaminodiphenylsulfone, about 0-100% by wt. 3,3'-diaminodiphenylsulfone, and about 0-0.2% by wt. chromium octotate; and

evaporating the solvent portion of the adhesive coating.

44. (Original) The process of Claim 43, wherein the metal material is selected from the group consisting of titanium, aluminum, stainless steel, nickel, and copper.

45. (Currently Amended) A continuous surface preparation process for titanium foil material, said process comprising:

grit blasting the titanium foil with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 280;

rinsing the foil with water to remove the grit from the foil;

subjecting the foil material to a caustic solution of sodium hydroxide wherein the caustic solution of sodium hydroxide has a concentration of about 25% by weight sodium hydroxide;

rinsing the foil with water to remove the caustic solution of sodium hydroxide from the foil;

applying a sol-gel coating to the foil wherein the sol-gel is a mixture of a zirconium n-propoxide 3-glycidoxy-propyltrimethoxysilane, glacial acetic acid, and a surfactant;

evaporating the water portion of the sol-gel coating;

applying a liquid adhesive coating directly to the sol-gel coating on the foil wherein the liquid adhesive coating is an epoxy-based adhesive coating including:

an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber; and

a second curative material comprising about 0-100% by wt. 4,4'-diaminodiphenylsulfone, about 0-100% by wt. 3,3'-diaminodiphenylsulfone, and about 0-0.2% by wt. chromium octotate; and

evaporating the solvent portion of the adhesive coating.

46. (Canceled).

47. (Withdrawn) The product made by the process of Claim 1.

48. (Withdrawn) The product made by the process of Claim 4.

49. (Withdrawn) The product made by the process of Claim 16.

50. (Withdrawn) The product made by the process of Claim 24.

51. (Withdrawn) The product made by the process of Claim 43.

52. (Withdrawn) The product made by the process of Claim 45.

53. (Withdrawn) Apparatus for continuously removing the oxide layer from a metal material, the apparatus comprising:

tilt rollers for continuously tilting the metal material from a horizontal orientation to a vertical orientation;

a wet hone chamber for continuously grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water;

a multiple stage water rinse chamber for continuously removing grit from the metal material; and

tilt rollers for continuously tilting the metal material back to a horizontal orientation from a vertical orientation.

54. (Withdrawn) Apparatus for continuously applying a sol-gel coating to metal material, the apparatus comprising:

a caustic conditioner chamber for continuously subjecting the metal material to a caustic solution of sodium hydroxide;

a rinse camber for continuously rinsing the metal material with water to remove the

caustic solution of sodium hydroxide;

a sol-gel coating chamber for continuously applying a sol-gel coating to the metal material; and

an oven for continuously evaporating the water portion of the sol-gel coating.

55. (Withdrawn) Apparatus for continuously applying an adhesive coating onto a sol-gel coating on a metal material, the apparatus comprising:

an adhesive coating section for continuously applying a liquid adhesive coating to the sol-gel coating on the metal material; and

an oven section for continuously evaporating the solvent portion of the adhesive coating.

56. (Withdrawn) The apparatus of Claim 55, wherein adhesive coating section comprises a dip-coating tank.

57. (Withdrawn) The apparatus of Claim 55, wherein adhesive coating section comprises spray nozzles.

58. (Withdrawn) Apparatus for continuously preparing the surface of metal material, said apparatus comprising:

tilt rollers for continuously tilting the metal material from a horizontal orientation to a vertical orientation;

a wet hone chamber for continuously grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water;

a multiple stage water rinse chamber for continuously removing grit from the metal material;

tilt rollers for continuously tilting the metal material back to a horizontal orientation from a vertical orientation;

a caustic conditioner chamber for continuously subjecting the metal material to a caustic solution of sodium hydroxide;

a rinse camber for continuously rinsing the metal material with water to remove the caustic solution of sodium hydroxide;

a sol-gel coating chamber for continuously applying a sol-gel coating to the metal material;

an oven for continuously evaporating the water portion of the sol-gel coating;

an adhesive coating section for continuously applying a liquid adhesive coating to the sol-gel coating on the metal material; and

an oven section for continuously evaporating the solvent portion of the adhesive coating.

59. (Withdrawn) The apparatus of Claim 58, wherein adhesive coating section comprises a dip-coating tank.

60. (Withdrawn) The apparatus of Claim 58, wherein adhesive coating section comprises spray nozzles.

61. (Original) The process of Claim 4 wherein the liquid adhesive coating is applied in a dip-coating tank.

62. (Original) The process of Claim 4 wherein the liquid adhesive coating is applied by spraying.

63. (Previously Presented) The process of Claim 43 wherein the liquid adhesive coating is applied in a dip-coating tank.

64. (Previously Presented) The process of Claim 43 wherein the liquid adhesive coating is applied by spraying.

65. (Previous Presented) The process of Claim 43 wherein acetone is used as the solvent for the adhesive.

66. (Previously Presented) The process of Claim 43 wherein the dry adhesive coating has a thickness of 0.1 to 3.0 mils.

67. (Previously Presented) The process of Claim 45 wherein the liquid adhesive coating is applied in a dip-coating tank.

68. (Previously Presented) The process of Claim 45 wherein the liquid adhesive coating is applied by spraying.

69. (Previously Presented) The process of Claim 45 wherein acetone is used as the solvent for the adhesive.

70. (Previously Presented) The process of Claim 45 wherein the dry adhesive coating has a thickness of 0.1 to 3.0 mils.

71. (New) The process of Claim 4, wherein the second curative material comprises about 99.8-99.99% by wt. of at least one of 4,4'-diaminodiphenylsulfone and 3,3'-diaminodiphenylsulfone, and about 0.01-0.2% by wt. chromium octotate.